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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/686,616

10/17/2003

Takeshi Oumaru

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05/26/2006

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ALEXANDRIA, VA 22314

EXAMINER

RUTLAND WALLIS, MICHAEL

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/686,616

Applicant(s)

OUMARU ET AL.

Examiner

Michael Rutland-Wallis

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/17/03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

In view of applicant's arguments traversing the species election, the requirement is hereby withdrawn; therefore all claims have been examined below.

### ***Specification***

The disclosure is objected to because of the following informalities: page 1 line 21 "a temperature substantially and" The office objects to the language and it is suggested to amend it to read "a temperature substantially higher and..." first mentioned in page 3 the language "a heat come hard to arise" this phrase is unclear to the office.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**1. With respect to claim 1**

**A.** The limitation "bring into action". It is unclear what applicant intends by bring into action.

**B.** The limitation "a part" and "another part" is objected to in claim 1 and subsequent depending claims and suggested to be changed to "a first group" and "a second group".

**C.** The limitation "a part of said control electrodes" there is not clearly seen by the office what part of the control electrode applicant is referring. This language is interpreted to refer to a first group of control electrodes.

**D.** The limitation "a region control" is suggested to be changed to "a regional control signal".

**E.** The limitation "said control part repeats a regional control" it is unclear how a regional control is repeated, as the claim does not recite a regional control has not been transmitted.

**F.** The limitation line 12 "said input signal" as the examiner understands applicant's invention the input signal to another part of control electrodes is a separate input signal, It is therefore suggested this limitation be changed to a second or separate defined input signal.

G. The limitation "after the operation of said part" it cannot be determined what part applicant is referencing as the claim references at least a part of plural power semiconductors and a part of control electrodes.

2. With respect to claim 2

A. The limitation "general control" should be changed to "general control signal".

B. The limitation "bring identically into action" is unclear to what applicant intends

3. With respect to claim 3

The limitation "said input signal includes a pulse row" it is unclear how a signal includes structural limitation of a pulse row.

4. With respect to claim 5

A. The limitation "at least one detecting part is plural" it is unclear how a detecting part is plural.

B. The limitation "said detecting parts" lack proper antecedent basis.

***Claim Rejections.- 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The rejections to claims 1-9 following below are made by office as best can be understood in view of the lack of clarity cited above in order to further prosecute the merits of the instant application.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koishikawa (U.S. Pat. No. 5,351,162) in view of Yang (U.S. Pat. No. 6,429,691)

With respect to claim 1 Koishikawa teaches a power semiconductor device (Fig. 2), comprising: plural power semiconductor elements (items CGa- CGn) which have a control electrode (gate terminals) and a first (source terminals) and a second current electrodes (drain terminals), respectively, and said first current electrodes are connected with each other and said second current electrodes are connected with each other (see connection of Fig. 2), respectively; and a control part (item 13) controlling said plural power semiconductor elements, wherein said control part repeats a regional control (column 3 line 65 – column 4 line 13 Koishikawa teaches item 13 is used to generate a signal to the control the on/off action of the power semiconductor elements) to bring a part of said plural power semiconductor elements by providing an input signal (input signal Vga for example is provided to control the semiconductors) for a part of said control electrodes, and to bring another part of said plural power semiconductor elements into action by providing said input (item VGb for example) signal for another part of said control electrodes. While Koishikawa does address the timing of the action of power semiconductor elements It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Koishikawa to include switch the power semiconductor elements part after another part has finished in order to reduce tail

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currents as Yang (column 4 lines 15-40) provides a teaching of such semiconductor switching.

With respect to claim 2 the device of Koishikawa may bring the all of the semiconductor devices in to action or a particular region depending on the output of the gate detection circuit.

With respect to claim 3 Koishikawa teaches input signal includes a pulse row (see pulse row SS terminals), and said control part performs said operation of said part and an operation of said another part in said regional control on each pulse basis.

With respect to claims 4 and 5 Koishikawa teaches a detecting part (item 111 comparator) detecting information corresponding to an operating condition of said plural power semiconductor elements, wherein said detecting part provides said information for said control part and said control part selects said part and said another part of said plural power semiconductor elements being made to operate when said regional control is performed on the basis of said information.

With respect to claim 6 Koishikawa as modified by Yang teach the device of claim 4 where detection is performed by a comparator element, Koishikawa further teaches the use of temperature sensors (see Fig. 2) to detect for over heating conditions. It would have been obvious to one of ordinary skill in the art at the time of the invention to use temperature detecting means in a similar connection to the detection element detailed in claim 4 in order to detect overheat conditions of the control parts.

With respect to claim 7 Koishikawa as modified by Yang teach the device of claim 4 where detection is performed by a comparator element, and while the primary goal of Koishikawa is to detect and protect from over current conditions therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a over current detection means to detect an over current condition in the control part or electrodes as claimed.

With respect to claim 8 Koishikawa as modified by Yang teach the device of claim 4 where detection is performed by a comparator element, and further teach the detecting element is a voltage detector, and said information is a voltage between said first and said second current electrodes of said power semiconductor element.

With respect to claim 9 Koishikawa as modified by Yang teach the voltage detection of described in claim 4 and 8 and while the direction of the voltage is not taught in Koishikawa it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cited combination to detect a backward voltage between the current electrodes in order to assume the device is operating properly and the appropriate voltages signals are received.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Marrotta et al. (U.S. Patent No. 6,697,283) teaches a similar system relevant to claim 6.




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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Rutland-Wallis whose telephone number is 571-272-5921. The examiner can normally be reached on Monday-Thursday 7:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on 571-272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MRW

  
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